

### AMENDMENT TABLE

Revision Level	Date	Description of amendment	Pages affected
Draft PPT-01-01			
PPT-01-02	18/05/95	Mandatory requirement cross references in all checklists. Changes to tables 1 and 4. Heading numbers on page 3, introductory section.	Section 1 3,4,5,9
PPT-02-01	25/04/96	Updated checklists to be in agreement with issue of Proposed standard 'Surveying of Navigation Facilities'.	All pages Sections 1 to 6
PPT-02-02	04/03/97	Editorial amendments.	Project Plan pages 4 & 5

### LABELS

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The following prefixes have been used in this document to identify the categories that the labelled pages refer to:-

- AR Aerodrome checklists.
- CC Contents Complete - master checklists.
- ER Off-Aerodrome / En route checklists.
- EX Existing data checklists.
- FS Forms, examples.
- GR Geodetic checklists.
- PPT Project Plan Template.

The following abbreviations have been used to classify the checklist items:-

- M Mandatory.
- R Recommended.
- X Implicit information required to enable the mandatory requirements to be met.

### CONTENTS

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#### PROJECT PLAN

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#### CHECKLISTS

<b>Section 1</b>	Pre Audit .....	CC001 to CC004
<b>Section 2</b>	Geodetic Survey.....	GR001 to GR011
<b>Section 3</b>	Aerodrome Survey.....	AR001 to AR010
<b>Section 4</b>	Off-Aerodrome Survey.....	ER001 to ER008
<b>Section 5</b>	Existing Data.....	EX001 to EX006
<b>Section 6</b>	Supplementary Survey Requirements.....	_____ to _____

## 1. Objective

This document is a template for project planning. The purpose is to provide a structured approach to using a set of checklists to assess the report submitted on completion of the particular survey.

It is intended that one such template be completed for each survey to be made within the Administration's survey programme. Each template contains a complete set of checklists based upon the EUROCONTROL standard 'Surveying of Navigation Facilities ( ES-007-xx). Cross references are included to identify each checklist item with the related paragraph in the above standard. Not all the checklists are required for every survey, so one of the initial tasks is to go through the template and identify those sheets that are relevant to the particular survey data type in question.

By following the tables sequentially an idea of the task flow can be gained. The later tables are the more detailed, the first tables provide more of a summary of what has been achieved or current project status. The intention being that the first of these pages should give the completed summary.

## 2. How to use this manual

1. Keep a blank master copy of the template.
2. Make sufficient copies to provide one blank template for each survey expected in your programme.
3. For each proposed survey go to **Table 1**:-
  - Complete the area / location name.
  - Enter the type of survey to be done. i.e.
    - ◇ geodetic
    - ◇ aerodrome
    - ◇ off-aerodrome / en route
  - Enter the proposed start date.
4. Go to **Table 2** :-
  - Identify the checklist numbers that are given for the data type. i.e.
    - ◇ geodetic
    - ◇ aerodrome
    - ◇ off-aerodrome / en route
  - go through the template and check off those that are needed.
  - mark off those that are not needed for the survey type.
  - for evaluation of existing data from previous surveys identify the relevant additional checklist for the data type.

**Note:**

1. There is a blank set of checklists that can be used to accommodate supplementary requirements for any additional survey work that the Administration may require. Add a reference number to these checklists and complete the blank spaces in **Table 2** and again on the contents page.

2. When using the checklists the summary section at the bottom of the page should note those **mandatory** items that have been checked **NO**. The summaries can then be looked at when evaluating the **conformance** or **non conformance** of the survey.

5. On completing the modified template check the box in **Table 3** :-

- Check off and record the date the survey is completed.
- Check off and record the date the assessment is completed.
- Notify EUROCONTROL of survey progress.

6. Assessment status - **Table 4** :-

- Complete assessment report form FS001.
- Record assessment result in **Table 4**.
- Issue conformance notification.
- Record whether a follow up of corrective action is necessary.
- Complete a corrective / remedial action form.

7. After assessment : -

- For survey conformance go to **Table 5**. Note any recommendations that may be of benefit to future surveys.
- For survey non conformance go to **Table 6**. Implement corrective action for this survey.

8. Follow-up of any corrective action:-

- Complete **Table 6**.
- Update **Table 4** and **Table 3**.



9. Implement noted corrective action (**Table 6**) or recommendations (**Table 5**) in planning subsequent surveys.

TABLE 1	SURVEY PROJECT
<b>SURVEY LOCATION</b> Enter on the front cover ●	
<b>SURVEY TYPE</b> * (geodetic, Off-Aerodrome , aerodrome)	
<b>SURVEY BY</b> (company/ department)	
Scheduled start date	
Completion date	

\* Note: installing a control network at an aerodrome is considered to be a geodetic survey, whilst all survey work of airfield facilities (thresholds etc.) should be included in an aerodrome report.

TABLE 2		SURVEY TYPE
SURVEY TYPE	CHECK WHICH ARE REQUIRED	CHECKLIST RANGE
PRELIMINARY CHECK	<input checked="" type="checkbox"/>	CC001
GEODETTIC		CC002 and GR001 to GR011
AERODROME		CC003 and AR001 to AR010
OFF AERODROME / EN ROUTE		CC004 and ER001 to ER008
EXISTING DATA For previous surveys select also the checklists for the relevant survey type below.		EX001 to EX007
Previous survey - Geodetic		GR001 to GR009
Previous survey - Aerodrome		AR001 to AR008
Previous survey - Off-Aerodrome / En route		ER001 to ER006
ADDITIONAL SURVEY PROGRAMME		

TABLE 3		TASK	SUMMARY
TASK		Check Box	DATE COMPLETED
Template prepared for survey designated in table 1.			
Checklist assessment completed			
Informed EUROCONTROL of progress update.			

TABLE 4		ASSESSMENT STATUS	Date	Check box*
<b>ASSESSMENT REPORT COMPLETED.</b> [ FORM FS 001]				
<b>ASSESSMENT RESULT = CONFORMANCE</b>  NOTIFICATION GIVEN   <b>GO TO TABLE 5</b>				
<b>ASSESSMENT RESULT = NON CONFORMANCE</b>  NOTIFICATION GIVEN   <b>GO TO TABLE 6</b>				
*	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO		

<b>TABLE 5 ACCEPTED DATA</b>	
	<b>Check Box</b>
<b>DATA FORMAT APPLIED</b>	
<b>DATA VERIFIED AND VALIDATED WITH SOURCE</b>	
<b>CRC APPLIED TO DATA</b>	
<b>NOTE ANY RECOMMENDATIONS</b> ( Use window provided below )	
<b>UPDATE TABLE 3</b>	
<b>RECOMMENDATIONS</b>	

TABLE 6	TASKS - NON CONFORMANCE	
	Comments	Check Box
Assessment reviewed.		
Remedial/ corrective action form completed  [ FS002 ]		
Corrective action implemented		
Follow up satisfactory		
Update Table 4 [assessment status]		
Update Table 3		

### ASSESSMENT RECORD

Date of Assessment : \_\_\_\_\_

Type of Survey : \_\_\_\_\_

Company/ Department: \_\_\_\_\_

Assessment Made by : \_\_\_\_\_

Previous Assessment Made? :      • Yes      • No

Date :      Reference :

Summary of checklist findings:

Corrective Action Required :      • Yes      • No

Signatures

\_\_\_\_\_  
Quality Manager

\_\_\_\_\_

Follow-up needed :      • Yes      • No

Proposed Date : \_\_\_\_\_

Detail : \_\_\_\_\_

Signature

\_\_\_\_\_  
Quality Manager

FS001

### REMEDIAL ACTION

Request Reference No : \_\_\_\_\_ Date : \_\_\_\_\_

Action raised by : \_\_\_\_\_ Department/Company : \_\_\_\_\_

Problem or Non conformance:

Remedial Action :

Target date for completion of corrective action :

Signatures

\_\_\_\_\_  
Quality Manager

Follow-up satisfactory:    • Yes    • No    Date : \_\_\_\_\_

Detail :

Signature

\_\_\_\_\_

FS 002

### Cross References to the Checklists for Mandatory and Recommended Requirements.

'Surveying of Navigation Facilities' reference	Description	Checklist cross reference
4.1.1	All facilities referenced to WGS 84	GR 004
4.1.2	Surveys respect to global geodetic reference frame	GR 004
4.1.3	Recommended geodetic reference frame is ETRF 89	GR004
4.2	Coordinate data quality	GR 008, ER 005, AR 008, EX 006
4.3	Survey accuracy requirements	GR 008, ER 005, AR 008, EX 006
4.4.1	95% position accuracy probability	GR 008, ER 005, AR 008
4.4.2	Survey accuracies and error budget	GR 008, ET 005, AR 008
4.5.1	Units of measurement	AR 010, ER 007 GR 010, EX 006
4.5.2	Published positions according to ICAO requirements	AR 010, ER 007, GR 010, EX 005
4.5.3	Published positions as sexagesimal degrees.	AR 010, ER 007, GR 010, EX 005
4.5.4	Dimensions and distances	AR 008, GR 009, ER 007, EX 005
4.6.1	Aerodrome survey control network	GR 003
4.6.2	Minimum number of network control stations.	GR 003
4.6.3	Recommended minimum number of network stations	GR003
4.6.4.1	Network station accuracy requirement	GR 008
4.6.4.2	Recommended internal consistency for control network	GR008
4.6.5.1	Mathematical transformations - control network coordinates	GR 004
4.6.5.2	Usage of transformation methods.	EX 003, GR 004, ER 004
4.6.6.1	Survey station monumentation	GR 006
4.6.6.2	Recommended practices for station monumentation	GR 006
4.6.6.3	Survey station numbering	GR 006
4.6.6.4	Recommendations for station labelling and numbering	GR 006
4.6.6.5	Aerodrome survey network plan	GR 005
4.6.6.6	Station descriptions	GR 006
4.6.6.7	Recommendations for inspection of the station area.	GR 006
4.6.7.1	Determination of aerodrome control network coordinates	GR 004
4.6.7.2	Direct geodetic connection to ETRF 89 reference frame	GR 004
4.6.7.3	Recommended number of connection points for static DGPS observations.	GR 004
4.6.7.4.1	Derived geodetic connection for existing control network	GR 004
4.6.7.4.2	Connection details recorded in the survey report	GR 004
4.6.8.1	Local relationship between existing datum and WGS 84	GR 004
4.6.8.2	Accuracy of determination of local relationship	GR 004
4.6.8.3	Reporting of local relationship values and accuracies	GR 004
4.6.9	Survey reporting format requirement (geodetic control)	CC 002
4.7.1	Minimum survey accuracy requirements - table 4.1	GR 008, ER 005, AR 008, EX 006
4.7.3/1	Recommendation to survey to the accuracy and resolution of equipment used.	GR 008, AR 003, ER 003
4.7.3/2	Recommendation to record height data where equipment or technique yields height data.	GR 008
4.8.1.1	Runway centre line for surveying purposes	AR 003
4.8.1.2	Irregular runway edge	AR 003
4.8.1.3	Threshold point where threshold markers exist	AR 004
4.8.1.4	Threshold point where there are no markers	AR 004

Cross Reference Table cont'd.

'Surveying of Navigation Facilities' reference	Description	Checklist cross reference
4.8.1.5	Select survey point where no markers/lighting exists	AR 004
4.8.1.6	Survey witness marks at the threshold point	AR 004
4.8.1.7	Survey of two associated runway centreline points.	AR 004
4.8.1.8	Collinearity check of the 3 points.	AR 004
4.8.1.9	Recommendation for collinearity check using 4 points.	AR 004
4.8.1.10	Threshold to end of runway paved surface distance.	AR 004
4.8.2.1	Threshold calculation from offset survey point.	AR 004
4.8.2.2	Collinearity check for threshold point determined in 4.8.1.9.	AR 004
4.8.3.1	Survey point on aircraft stands.	AR 005
4.8.3.2	Diagram for survey point on aircraft stands.	AR 005, AR 006
4.8.4	Survey point for other aerodrome facilities.	AR 005
4.8.5	Survey reporting format requirement ( aerodromes ).	CC 003
4.9.1.1	Off-Aerodrome radio navigation facility survey accuracy.	ER 005
4.9.1.2	Proof that accuracy is met for conversion of existing data.	EX 004
4.9.1.3	Quality requirement for existing coordinates.	EX 006
4.9.1.4	Recommendation to publish surveyed coordinates in preference to those derived graphically.	EX 002
4.9.2.1	Description of Off-Aerodrome radio navigation facilities.	ER 003
4.9.2.2	Collocated VOR/DME survey position.	ER 003
4.9.2.3	Where non collocated VOR/DME greater than 30 metres.	ER 003
4.9.2.4	Where ETRF 89 not possible, describe method of local connection.	ER 004
4.9.3	Survey reporting format requirement (Off-Aerodrome facilities).	CC 004
4.10.1	Validation of survey processing software.	ER 005, AR 008, GR 008, EX 006
4.10.2	Software validation report requirement.	ER 005, AR 008, GR 008, EX 006
4.11.1	ICAO WGS 84 digital format for survey data.	ER 007, AR 010, GR 010, EX 005
4.11.2	Relationship between a national standard format to 4.11.1.	ER 007, AR 010, GR 010, EX 005
5.1.1	Quality of coordinates can be assured.	AR 010, ER 008, GR 010, EX 006
5.1.2	Recommendation - use of quality management system.	AR 010, ER 008, GR 010, EX 006
5.1.3	Evidence provided to confirm required accuracies are met.	GR011, AR011, ER008, EX006
5.1.4	Coordinates not proven to have met accuracy requirement.	AR 010, ER 007, EX 005
5.2.1	Equipment calibration demonstrates suitable accuracy.	AR 008, ER 005, GR 008
5.2.2	Equipment calibration valid at the time of use.	AR 008, ER 005, GR 008
5.2.3	Calibration details included in the survey report.	AR 008, ER 005, GR 008
5.3.1	Accumulated errors included in accuracy report.	GR 008, AR 008, ER 005
5.3.2	Analysis of the accumulated error.	GR 008, AR 008, ER 005
5.4.1	Traceability of coordinates to their production source.	AR 011, ER 008, GR 011, AR007, ER006
5.4.2	Quality record basic information for coordinate source	AR 011, ER 008, GR 011
5.4.3	Non conformance for coordinates unable to satisfy 5.3.1 and 5.3.2.	TABLE 4, form FS001, AR 011, ER 008, GR 011, EX 006

### Cross Reference Table cont'd.

5.4.4	Supplementary data non compliance.	TABLE 4, form FS001, AR 011, ER 008, GR 011, EX 006
5.4.5	Maintenance of records for published coordinates.	EX 006
5.6.1	Non compliance issued where standards are not met.	TABLE 4
5.5.1	Survey reporting requirement to enable quality audits.	TABLE 2
5.6.2	Identification of the precise areas where quality is deficient.	TABLE 6, form FS001
5.7.1	Corrective action by the survey organisation.	TABLE 6, form FS002
5.7.2	Resubmission to show corrective action taken.	TABLE 6